SYSTEM SUPPORT DIRECTIVE

ASR-9 | 6310 | SSM-ASR9-005

System Support Modification

PROCESSOR AUGMENTATION CARD PHASE I

Highlights
- False Target Removal
- Code Degarbling
- Satellite Airports

4/1/99

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1. **PURPOSE.** This System Support Modification (SSM) authorizes a modification to the Array Signal Processor (ASP), the Message Interface Processor (MIP) and the Remote Monitoring Subsystem (RMS) within the Airport Surveillance Radar-9 (ASR-9). This modification encompasses changes necessary for the ASR-9 Processor Augmentation Card (9-PAC) Phase I integration.

2. **DISTRIBUTION.** This directive is distributed to selected field offices and services within Washington headquarters, regional Airway Facilities divisions, William J. Hughes Technical Center, Mike Monroney Aeronautical Center, and the Airway Facilities offices having the following facilities/equipment: ASR-9.

3. **WITHDRAWALS/CANCELLATIONS.** Not applicable.

4. **REFERENCES.**
   a. Configuration Control Decisions (CCD) N15173, N20699, T15774, and N20714.
   b. Hardware Discrepancy Reports (HDR) 03182015V, 03182016V, 03182017V, 05076040V, 05076041V, 09177037V, 09177039V, 11047046V, 11047047V, 11047048V, and 08118023V.

5. **BACKGROUND.**
   a. The ASP has insufficient bandwidth to perform uplink reflection elimination. The ASP is unable to eliminate other types of beacon false targets, such as downlink reflections, wide pulse, and intermode jitter. The 9-PAC augments the power of the ASP. The 9-PAC dynamic reflection algorithms safely eliminate unwanted discrete and nondiscrete uplink reflections. The 9-PAC algorithms also detect and correct for transponder problems like wide pulse and intermode jitter.

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b. The ASP has insufficient bandwidth to perform a best-fit Merge function. The first-fit Merge function currently employed is prone to making errors. The 9-PAC augments the power of the ASP. The 9-PAC's best-fit Merge function will help reduce the stitching problem which often occurs as an aircraft flies over areas of ground clutter.

c. Another cause of stitching is when poor radar centroids occur. The Merge function should use the radar or beacon centroiding that is better on a per target basis. The 9-PAC algorithms will use the beacon target position when the radar target has a low quality or confidence value.

d. A problem existed with tracking of the Search Real-Time Quality Control (RTQC) target in Mode Select (Mode-S) mode of operation. Alarm 61B (Correlated RTQC alarm) would occur when Mode-S was online and the RTQC target was positioned beyond 57 nautical miles (nmi). This modification corrects this problem.

e. San Francisco's primary radar is the Oakland ASR-9 located 9 miles across the bay. Most aircraft departing San Francisco fly over the South San Francisco area. This area is a severe ground clutter environment. Detection and tracking of radar targets in this area is poor. So poor, that if an aircraft forgets to turn on its transponder, it could fly up to 4 miles without correlating. This modification contains enhancements to the target centroiding in geocensored areas and the adaptive map functions of the ASP. These enhancements will improve detection and tracking of aircraft using satellite airports at all facilities.

f. The baseline ASR-9 Beacon Target Detector (BTD) software uses a 1/145 nmi conversion factor when converting BTD range clocks into nautical miles. This modification uses a more accurate 1/144.88 nmi conversion factor. This will improve the positioning of beacon target reports. The BTD range bias Variable Site Parameter (VSP) that has been compensating for this error, will be updated during the modification procedure.

6. **APPLICATION.** This modification is applicable to all ASR-9 sites.

7. **MATERIALS REQUIRED.** The materials required to perform this modification will be supplied in the form of a modification kit. The kit, part number NSN 0000-00-012-1567-1, consists of three 9-PAC boards (3D64905), 14 Erasable Programmable Read-Only Memories (EPROM) for installation on the RMS Single Board Computer (SBC) 428 EPROM expansion board inside the Intel 310 box, 18 EPROMs for installation on the MIP boards (1D63647), 45 EPROMs for installation on the ASP Read-Only Memory (ROM) boards (1D18904), and one floppy diskette for updating the site VSP diskette.

NOTE: The part number for the MIP board was changed by Order 6310.18, Message Interface Processor Board Update, FA-10067, FA-10068, Chapter 34, Change 47, dated 5/21/96. The old part number was 1D18925. The new part number is 1D63647.

NSN 0000-00-012-1567-1

ITEM	DESCRIPTION	NSN/PART NUM	QUANTITY
(1)	9-PAC Circuit board with flash card	5998-01-457-0870 (3D64905G01)	3 ea.

ITEM	DESCRIPTION	NSN/PART NUM	QUANTITY
(2)	27128 EPROM U30	647A144H17	3 ea.
(3)	27128 EPROM U31	647A145H17	3 ea.
(4)	27128 EPROM U50	647A146H17	3 ea.
(5)	27128 EPROM U51	647A147H17	3 ea.
(6)	27128 EPROM U60	647A148H17	3 ea.
(7)	27128 EPROM U61	647A149H17	3 ea.
(8)	27128 EPROM U01	647A526H16	3 ea.
(9)	27128 EPROM U02	647A528H16	3 ea.
(10)	27128 EPROM U03	647A521H16	3 ea.
(11)	27128 EPROM U04	647A522H16	3 ea.
(12)	27128 EPROM U05	647A529H16	3 ea.
(13)	27128 EPROM U06	647A531H16	3 ea.
(14)	27128 EPROM U07	647A520H16	3 ea.
(15)	27128 EPROM U08	647A523H16	3 ea.
(16)	27128 EPROM U12	647A527H16	3 ea.
(17)	27128 EPROM U13	647A532H16	3 ea.
(18)	27128 EPROM U14	647A518H16	3 ea.
(19)	27128 EPROM U15	647A524H16	3 ea.
(20)	27128 EPROM U22	647A530H16	3 ea.
(21)	27128 EPROM U23	647A533H16	3 ea.
(22)	27128 EPROM U24	647A519H16	3 ea.
(23)	27512 EPROM U5P	1A26051H14	1 ea.
(24)	27512 EPROM U3P	1A26052H14	1 ea.
(25)	27512 EPROM U5N	1A26053H14	1 ea.
(26)	27512 EPROM U3N	1A26054H14	1 ea.
(27)	27512 EPROM U5M	1A26055H14	1 ea.
(28)	27512 EPROM U3M	1A26056H14	1 ea.
(29)	27512 EPROM U5K	1A26057H14	1 ea.
(30)	27512 EPROM U3K	1A26058H14	1 ea.
(31)	27512 EPROM U5J	1A26059H14	1 ea.
(32)	27512 EPROM U3J	1A26060H14	1 ea.
(33)	27512 EPROM U5H	1A26061H14	1 ea.

ITEM	DESCRIPTION	NSN/PART NUM	QUANTITY
(34)	27512 EPROM U3H	1A26062H14	1 ea.
(35)	27512 EPROM U5E	1A26063H14	1 ea.
(36)	27512 EPROM U3E	1A26064H14	1 ea.
(37)	9-PAC Phase I VSP update floppy diskette	N/A	1 ea.

8. **SOURCE OF MATERIALS.** Materials are to be ordered through the Logistics and Inventory (LIS) system at the FAA Logistics Center. In order to prevent depletion of the materials, order only the quantity required.

   NOTE: The kit for this modification (part number NSN 0000-00-012-1567-1) cannot be ordered through the normal LIS system. This kit is being distributed from Facilities and Equipment (F&E) stock. Contact your regional LIS representative to order this kit.

   NOTE: After installation of this modification, should a failure of the 9-PAC baord occur, replacement 9-PAC boards can be order through the normal LIS system using part number NSN 5998-01-457-0870.

9. **SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED.** The following tools are required to complete this modification on an ASR-9 type system:

ITEM	DESCRIPTION	MANUFACTURER	PART NUMBER
a.	Integrated circuit (IC) insertion/ extraction tool	O.K. Industries Incorporation	WK-7
b.	Electrostatic discharge (ESD) mat	——	——
c.	Static control wrist strap	——	——

10. **PROCEDURE TO BE PERFORMED BY.** This modification is to be performed by field maintenance personnel or as determined by the regional Airway Facilities division manager.

11. **WHEN MODIFICATION IS TO BE PERFORMED.** This modification is to be performed as soon as possible after receipt of this chapter and the required materials, or as directed by the regional division manager.

12. **ESTIMATED TIME REQUIRED.** This procedure will require 1 technician for 8 employee-hours.

13. **DISPOSITION OF SURPLUS PARTS.** Keep the surplus Dual-Port Memory circuit boards on site as additional spares. Return the surplus EPROMs to the National Airway Systems Engineering Division, AOS-200, Team 270. Use the shipping materials and address label provided with the modification kit. If the shipping label is missing, please ship to the following address:

    FAA
    William J. Hughes Technical Center, AOS-270
    Atlantic City International Airport, Atlantic City, NJ 08405

14. **PROCEDURE.**

    NOTE: Review this entire procedure prior to beginning the modification.

    a. System Baseline Check. At the local site, check the status of each target channel prior to performing the modification.

        (1) Verify that no Summary Alarms (SA) exist in the post processor. Use RMS ALARM REPORT menu (0.2). Maintenance Alerts (MA) are allowable.

        (2) Run Fault Isolation Testing (FIT) on the post processor. Use menu 0.4.1 and select command number 5.

        (3) Locate the site's Facility Reference Data File (FRDF). This document will be updated later in the procedure.

    b. System Check - Spare Circuit Card Assembly (CCA).

    NOTE: Use ESD and wrist straps when handling CCAs. Always store and transport boards in antistatic bags.

        (1) Refer to TI 6310.26, ASR-9 System, Radar Receiver/Processor Channel A, (unit 2) Type FA-10067, Radar Receiver/Processor Channel B, (unit 5) Type FA-10068, Field Maintenance, paragraph 7.5.8, Dual Card Rack A4 Boards, for the removal and installation procedures.

        (2) Remove the MIP board (slot 207) from the offline channel and install the spare.

        (3) Remove the ASP ROM board (slot 223) from the offline channel and install the spare.

        (4) Perform System Baseline Check in paragraphs 14a(1) and 14a(2) to verify that no alarms exist with the spare CCAs.

    c. System Check - Current VSP Values. The VSP disk will be modified later in this procedure. This modification mostly consists of adding new files; but there are some modifications to existing files. In order to ensure that these existing VSPs are reloaded properly after modification, it is necessary to make note of their current values. Write down the current value of the following Post Processor VSPs using the VSP Change menus (baseline values are shown in parenthesis):

VSP 3101	_____	(5)
VSP 3102	_____	(5)
VSP 3103	_____	(-1)
VSP 3104	_____	(5)
VSP 3105	_____	(-1)
VSP 3213	_____	(3)
VSP 3214	_____	(-2)
VSP 3215	_____	(40)
VSP 3216	_____	(512)
VSP 3301	_____	(1)
VSP 3302	_____	(2)
VSP 3303	_____	(14)
VSP 3304	_____	(4)
VSP 3305	_____	(2)
VSP 3306	_____	(1)
VSP 3310	_____	(1)
VSP 3311	_____	(-1)
VSP 3C01	_____	(5)
VSP 3C02	_____	(2)
VSP 3C03	_____	(4)

NOTE: The values for existing VSPs 3201-3212, 3307, 3308, 3309, and 3312 DO NOT need to be recorded. These VSPs are being replaced with new ones.

d. RMS Modification.

(1) Proceed to the RMS bay (unit 3). Power OFF the RMS bay using the main power circuit breaker located on the front of the cabinet.

(2) Remove any bolts holding the RMS 310 box (3A7) front panel to the RMS bay (unit 3). For help in locating, refer to TI 6310.27, ASR-9 System, Remote Monitoring Subsystem, (unit 3) Type FA-10078, Field Maintenance, Figure 11-11, Central Processor Assembly A7 Removal/Installation.

NOTE: The following steps modify the RMS 310 box without removing it from the bay. If removal is preferred, refer to TI 6310.27, section 7.5.3.3, Central Processor Assembly A7 Removal Procedure. When completed, resume activity at paragraph 14d(5).

(3) Pull the chassis slide holding the RMS 310 box out about 4 inches. This will provide a space behind the unit in which to work.

(4) Remove the back panel to the RMS bay (unit 3).

CAUTION: There are many sharp edges in and around the RMS 310 box. Use caution so as to avoid scrapes, nicks, and cuts to your hands.

(5) At the rear of the RMS 310 box, locate and remove the 4 screws which hold the cable assembly panel to the back of the unit.

(6) Carefully pull back the cable assembly panel from the RMS 310 box about 6 inches. It is not possible to pull it back any further because of many short cables internal to the unit which connect the cable assembly panel to the individual circuit boards in the RMS 310 box card cage.

(7) Most of these short internal cables need to be detached from their circuit boards. Care must be taken to properly identify each cable for reattachment after the modification is performed.

(a) When viewed from the sides, you can see that there are 7 circuit boards in the card cage. However, two of these boards (the top and bottom) have piggy-back boards on them. Thus, when viewed from the center, there appear to be 9 rows of boards. When identifying the cables that attach to these boards, row 1 refers to the top board and row 9 refers to the bottom board. See Appendix, Figure 1, RMS Board and Cable Layout.

NOTE: The internal cables should already be marked as a result of previous modifications. If not, label each cable as described below:

(b) Using a marker or pen, label and detach each of the following cables: 1L, 1R, 2L, 4L, 4M, 4R, 5, and 6L.

(c) Remove the two metal retaining brackets that hold the circuit boards in the card cage. It is not necessary to completely remove the screws holding the bracket in place. The bracket will slide up freely once the screws have been loosened.

(8) Remove the SBC 428 EPROM expansion board from row 7. If the board proves difficult to remove, use the retaining brackets removed in paragraph 14d(7)(c) to provide additional leverage. Figure 1 identifies this as board 6.

NOTE: If the RMS 310 box was not completely removed from the bay for modification, taking out the SBC 428 expansion board can be made easier by carefully pulling back the whole 310 box and cable assembly panel a few inches. This should make enough room for sliding the board out of its slot.

(9) Remove the 12 EPROMs at U5P, U3P, U5N, U3N, U5M, U3M, U5K, U3K, U5J, U3J, U5H, and U3H. Replace them with the 14 new chips provided in the modification kit. Two new chips, U5E and U3E, go in previously unused positions.

(10) *Put the modified SBC 428 EPROM expansion board back into the RMS 310 box.* When seated properly, this board will be even with respect to the neighboring boards (must not be sticking out).

(11) Reinstall the two metal retaining brackets.

(12) Reattach all the short internal cables that were detached in paragraph 14d(7)(b).

(13) Reattach the cable assembly panel to the RMS 310 box using the 4 screws removed in paragraph 14d(5). If two are sheet metal screws and two are machine screws, then the sheet metal screws should go on the left side, as viewed from the rear of the box.

NOTE: If the RMS 310 box was removed from the bay for modification, replace it in the bay as described by TI 6310.27, section 7.5.3.4, Central Processor Assembly A7 Installation Procedure. When done, resume activity at the next step.

(14) Turn ON the RMS bay (unit 3) using the circuit breaker on the front of the cabinet.

(15) At the local RMS terminal, verify that the System Confidence Test passes and the RMS LOGON menu appears. Version number 26.4 should appear.

NOTE: If problems exist with RMS operation after modification, verify that no pins were bent on the newly installed EPROMs, verify that all boards are seated properly, and verify that the internal cables are attached properly. In general, cable connection problems will manifest as RMS/SBC wrapback alarms. Refer to Appendix, Table 1, RMS 310 Box Cable/Function Association for a summary of internal cables, external jacks and associated RMS interfaces.

(16) Push the RMS 310 box slide chassis back into the RMS bay.

(17) Put the RMS bay back panel back on.

(18) Logon to the local RMS terminal and enter the current time and date.

e. VSP Disk Modification.

(1) As a precautionary measure, make a backup of the current site VSP diskette.

(a) In order to ensure a good quality copy of the VSP diskette, clean the heads on both disk drives. If the heads have already been cleaned recently, then bypass this step. Refer to TI 6310.27, section 6.4.2, Cleaning of Computer-Flexible Disk Drive Read/Write Heads for this procedure.

(b) Place the current site VSP diskette in the lower disk drive.

(c) Place a blank or recycled double-sided, double density diskette in the upper disk drive.

(d) Go to RMS menu 0.5.1, **DISK IDENTIFICATION AND BACKUP**. Enter command 1, "Perform Disk Backup".

(2) Remove the original site VSP diskette from the lower drive and put it in a safe place. Leave the newly created VSP diskette in the upper disk drive.

(3) Place the 9-PAC phase I VSP update diskette provided in the modification kit in the lower disk drive. Note, the password for this diskette is "asr-09".

(4) Copy the 9-PAC VSP files from the 9-PAC VSP update diskette to the site VSP diskette. This procedure only copies those few files that are affected by this modification. Thus, the Geo-Censor Map, Clear Day Map, and other VSPs on the site VSP diskette are not disturbed. From RMS menu 0.5.1, enter the following commands:

(a) 3,A31.VSP<CR>

(b) 3,B31.VSP<CR>

(c) 3,A32.VSP<CR>

(d) 3,B32.VSP<CR>

(e) 3,A33.VSP<CR>

(f) 3,B33.VSP<CR>

(g) 3,A3C.VSP<CR>

(h) 3,B3C.VSP<CR>

(i) 3,A3D.VSP<CR>

(j) 3,B3D.VSP<CR>

(k) 3,A3E.VSP<CR>

(l) 3,B3E.VSP<CR>

(m) 3,A42.VSP<CR>

(n) 3,B42.VSP<CR>

(o) 3,A43.VSP<CR>

(p) 3,B43.VSP<CR>

(q) 3,A44.VSP<CR>

(r) 3,B44.VSP<CR>

(s) 3,A54.VSP<CR>

(t) 3,B54.VSP<CR>

(u) 3,A55.VSP<CR>

(v) 3,B55.VSP<CR>

(5) Remove the 9-PAC phase I VSP update diskette from the lower drive and put it in a safe place.

(6) Remove the new VSP diskette from the upper drive. Put it in the lower disk drive. This new VSP diskette is required for all future VSP activity in a 9-PAC modified system. All other VSP diskettes are now obsolete. All other VSP diskettes should be marked as old so as to avoid confusion in the future.

NOTE: A backup copy of the new VSP diskette could be made at this point. But, some additional VSP changes are made later in this procedure. A backup will be made after all VSP changes have been completed.

f. Post Processor Modification. The following is the recommended procedure for modifying and installing the MIP, ASP ROM, and 9-PAC boards:

NOTE: Use ESD and wrist straps when handling CCAs. Always store and transport boards in antistatic bags.

(1) Refer to TI 6310.26, paragraph 7.5.8, Dual Card Rack A4 Boards, for the removal and installation procedures.

(2) In the channel currently containing the spare MIP and ASP ROM boards, remove the Dual-Port Memory board from slot 219. Take one of the 9-PAC boards provided in the modification kit and install it in slot 219.

NOTE: Eject and reinsert the 9-PAC flashcard to make sure the flash card is properly seated on the 9-PAC board.

(3) Using the MIP board currently not in the system, remove the 6 EPROMs at U30, U31, U50, U51, U60, and U61. Replace them with the new chips provided in the modification kit. Refer to TI 6310.39, CRF/Depot Maintenance, ASR-9 System, Type FA-10064, Figure 11-58, Message Interface Processor Board Assembly 2A4A207, for the location of these EPROMs.

(4) Using the ASP ROM board currently not in the system, remove the 15 EPROMs at U1 through U24. Replace them with the new chips provided in the modification kit. Refer to TI 6310.39, Figure 11-71, ASP ROM Board Assembly 2A4A223, for the location of these EPROMs.

(5) Put both modified boards back into the system by placing them in the channel currently containing the spare boards.

(6) Use RMS menu 0.1.2 to put this channel, the standby channel, into unavailable mode.

(7) Ensure that the VSPs recorded in paragraph 14c are set to their proper values.

(8) Go to RMS VSP CHANGE (menu 0.5.5). Load in the new VSPs by using the command to load all MIP VSPs from disk.

(9) Appendix, Table 2, SSM 5 new VSPs, lists all the new VSPs and their default values. These VSPs, with these values, were copied onto the VSP disk by the steps in paragraph 14e(4). The previous step, paragraph 14f(8), loaded all these values into the unavailable channel. Update the FRDF to reflect these new VSP values.

(10) Perform the steps in paragraphs 14a(1) and 14a(2) to verify that no faults exist with the modified boards or the new 9-PAC board.

NOTE: The Beacon RTQC alarm may occur (61C). This has been anticipated and does not constitute a failure to install the 9-PAC modifications properly. A VSP adjustment is required to eliminate this alarm. This will be done later in the procedure.

(11) Use System Control to put the currently unavailable channel back into standby and to switch the online channel.

(12) Modify the spare MIP board. Remove the 6 EPROMs at U30, U31, U50, U51, U60, and U61. Replace them with the new chips provided in the modification kit.

(13) Modify the spare ASP ROM board. Remove the 15 EPROMs at U1 through U24. Replace them with the new chips provided in the modification kit.

(14) In the channel currently offline channel, remove the Dual-Port Memory board from slot 219. Take one of the 9-PAC boards provided in the modification kit and install it in slot 219.

(15) Put both modified spare MIP and ASP ROM boards back into the system by placing them in the currently offline channel.

(16) Perform the steps in paragraphs 14f(6) through 14f(10) to modify the VSPs on the modified spare boards.

(17) Modify the remaining MIP board. Remove the 6 EPROMs at U30, U31, U50, U51, U60, and U61. Replace them with the new chips provided in the modification kit.

(18) Modify the remaining ASP ROM board. Remove the 15 EPROMs at U1 through U24. Replace them with the new chips provided in the modification kit.

(19) Remove the spare MIP, ASP ROM, and 9-PAC boards from the offline channel. Install the third and final 9-PAC board provided in the modification kit and install the remaining MIP and ASP ROM boards.

(20) Perform the steps in paragraphs 14f(6) through 14f(10) to modify the VSPs on the remaining boards.

g. Additional VSP Changes.

(1) Modify VSP 5313 (BTD Range Bias) by subtracting 2 from the current value. For example, if the current value is -2, change it to -4. Make this change to the offline channel. Refer to paragraph 5f for an explanation on why this VSP is being changed.

(2) Change VSP 3407 (Maximum Signal-to-Noise (S/N) Level of Threshold for Zero Filters Ring 7) to 25. It's baseline value was 20. Make this change to the offline channel. As part of the enhancements to the adaptive map, the area covered by each range ring has been altered. This is why VSPs 3407, 3408, and 3510 are being altered.

(3) Change VSP 3408 (Maximum S/N Level of Threshold for Zero Filters Ring 8) to 25. It's baseline value was 20. Make this change to the offline channel.

(4) Change VSP 3510 (Maximum S/N Level of Threshold for Non-Zero Filters Ring 10) to 27. It's baseline value was 22. Make this change to the offline channel.

(5) Change VSP 4107 (Minimum Delta Azimuth for Move Test) to 16. It's baseline value was 32. Make this change to the offline channel.

(6) A powerful feature of the 9-PAC software is the ability to detect and eliminate false beacon targets caused by uplink reflection. The software has separate algorithms for handling discrete and nondiscrete beacon codes. Basically, the discrete algorithm is more aggressive than the nondiscrete algorithm. This is because there normally aren't two real aircraft on the same discrete code in the radar's coverage area at the same time. However, some facilities do assign discrete codes to multiple aircraft at the same time as a normal part of operations (e.g. overflights, helicopters, parrots, test target generator codes). These are discrete codes that are being used in a "nondiscrete" manner. The 9-PAC has VSPs that can inform it of which discrete codes should use the less aggressive nondiscrete algorithms. Go to RMS menu 0.5.3.5.5 (NONDISCRETE 3/A CODE LIST) and enter up to 20 discrete codes that should be treated as nondiscrete. Load these VSPs into the offline channel.

(7) After installation of the 9-PAC board, the Beacon RTQC alarm (61C) may have occured. This is because the original software used a plus-or-minus 10 ACP acceptance window and the new software uses a tighter plus-or-minus 4 ACP tolerance. Since the position of the RTQC target depends on the Pulse Repition Frequency (PRF) and it's position within the PRF pattern, a change to the VSP that controls it's position should eliminate the alarm. Thus, if your site currently has this alarm, adjust the beacon RTQC azimuth VSP 5105 by adding or subtracting 1 to 16 ACPs. Some experimentation may be required to find the correct adjustment.

(8) Switch online channels. Perform the steps in paragraphs 14g(1) through 14g(7) to modify these VSPs in the other channel.

(9) Update the FRDF to reflect these new VSP values.

(10) All the above VSPs are stored on the MIP board. Install the spare MIP board in the currently offline channel. Use RMS menu 0.5.5 (CHANNEL, GEO-CENSOR, AND CDM LOADS) to load all MIP VSPs into the offline channel.

h. GeoCensor Map Tweaking. A requirement of the original ASP software was to never split target data tagged as geocensored. Most of the time, ground clutter appears adjacent to other ground clutter. Thus, not splitting the ground clutter target into two helps reduce the number of unwanted radar-only targets output from the system. However, when an aircraft flies over or adjacent to ground clutter, this requirement prevented the proper detection and tracking of the aircraft. This modification allows geocensor tagged data to split. This improves detection and tracking of aircraft in areas of ground clutter. A side effect is an increase in the number of unwanted radar targets from ground clutter. To prevent these additional unwanted radar targets from correlating (tracking), the geocensor map must be updated.

(1) TI 6310.42A, ASR-9 Optimization Procedures, section 3.2.7, Geographic Censor Map, describes the procedure for building a geocensor map from scratch. However, rebuilding the whole map from scratch is not desirable. A simple update of the exisiting map is sufficient.

(2) Use WRITEASR to record data for 1 hour (800 scans).

(3) Use PLOTASR to view the recorded data in 40 scan increments.

(4) Look for correlation of false alarm targets that occur in the same area on multiple scans. Especially look at areas adjacent to existing geocensor map cells (confidence 0 and confidence 1 radar targets).

(5) Identify the range (64ths nmi) and azimuth (ACP) of each false correlated target cluster.

(6) Use the conversion charts in TI 6310.42A, ASR-9 Optimization Procedures, Figures 3-12 and 3-13 of to help convert the range into geo-cells and the azimuth in CPI-PRs.

(7) Use RMS menu 0.5.3.7 to load these new cells into the geocensor map for each channel.

(8) If needed, repeat the steps in paragraphs 14h(2) through 14h(7) to record data from different periods of road traffic activity.

(9) Make backup copy of final VSP disk.

i. Reflector File Generation. The ability to automatically detect the location of reflective surfaces in the environment and to store this information in a data base for use in eliminating false beacon targets is a powerful feature of the 9-PAC board. In order to allow the 9-PAC to build an optimal data base, let it run uninterrupted for 2 weeks.

NOTE: If your facility is equipped with a Mode-S beacon system, it must be placed in backup mode to allow the 9-PAC to operate. Set Mode-S SAP to force IBI.

15. **TESTS AFTER MODIFICATION.** Not applicable.

16. **RESULT OF MODIFICATION.** A side-effect of one of the features of this modification is an increase in the number of uncorrelated radar target reports output by the system. The modification procedure includes updating the geocensor map in order to prevent unwanted reports from correlating.

WARNING: Do not use the 9-PAC board with the current extender board (1D24955G01). The circuits of the 9-PAC board are too close to the edge. Use of the current extender boards will cause shorts on the 9-PAC board; thereby, damaging it. A project is underway to have all extender boards milled down. This will prevent the edges of the extender board from contacting the circuits on the edge of the 9-PAC board.

17. **CHANGES TO INSTRUCTION BOOKS.** One set of change pages is attached. This set of pages is to remain with this directive. A new Technical Instruction book, TI 6310.26 SUP 1, ASR-9 Processor Augmentation Card – Phase I, is also being delivered in the attachments.

18. **CHANGES TO INSTALLATION DRAWINGS.** Not applicable.

19. **CHANGES TO RECORDED DATA.** Prepare FAA Form 6032-1, Airway Facilities Modification Record, showing this directive number, date, and sequence number to change recorded data.

20. **ADDRESS CHANGES.** Submit facility address, directive copy count, and additions or deletions via cc:Mail to Pat Conner, AOS-530.

21. **CLARIFICATION OR COMMENTS.** Not applicable.

22. **STATUS ACCOUNTING.** Perform both the following status accounting activities:

a. Ensure that the Quarterly NAS Equipment and SSM Status report is updated to indicate the installation of this modification.

b. Use the Maintenance Management System (MMS) application Log Equipment Modification (LEM) function to report the completion of this modification. Verify that an "N" is in the "REP COD" field to ensure that the log entry will be upwardly reportable to the national data base for access by AOS. This directive should be entered into the LEM fields as follows:

(1) Order No.: 6310.

(2) Chapter: SSM-**005**

(3) Change: SW

23. **RECOMMENDATIONS FOR CHANGES.** Forward any recommendations for changes to this directive through normal channels to the National Airway Systems Engineering Division, AOS-200, Team AOS-270, on (609) 485-4357.

for Gerald Pritchard
George W. Terrell
Program Director for Operational Support

4-1-99
Date

LIST OF APPENDIXES AND ATTACHMENTS

Item	Description	Quantity
APPENDIX	SUPPORTING RMS ILLUSTRATIONS	1
ATTACHMENT 1.	TI 6310.24 ASR-9 SYSTEM, INSTRUCTION BOOK	1
ATTACHMENT 2.	TI 6310.26 ASR-9 SYSTEM, SECTIONS 1-11, INSTRUCTION BOOK FIELD MAINTENANCE	1
ATTACHMENT 3.	TI 6310.26 SUP1, ASR-9 SYSTEM	1
ATTACHMENT 4.	TI 6310.39, ASR-9 SYSTEM, SECTIONS 1-2, VOLUME 1, INSTRUCTION BOOK CRF/DEPOT MAINTENANCE	1
ATTACHMENT 5.	TI 6310.39, ASR-9 SYSTEM, SECTION 8, VOLUME 3, CRF/DEPOT MAINTENANCE	1